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This technical report is the second in a series of reports evaluating the impact of the Army's Comprehensive Soldier Fitness (CSF) Program by examining relationships between reported resilience and psychological health (R/PH) and various health and behavioral outcomes (both positive and negative) among Soldiers. In this report, we first focused on the relationship between R/PH and positive objective outcomes related to high job performance (promotions and selections), and later turned our attention to the relationship between R/PH and high academic achievement (working in careers that require advanced terminal degrees, such as medical doctors and lawyers). While the results strongly suggest that there is a relationship between R/PH and the objective measures of high job performance, results do not support a relationship between R/PH and high academic achievement. Future evaluation will be required as data becomes available in order to derive causality.

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Report #2: Positive Performance Outcomes in Officers (Promotions, Selections, & Professions)

April 2011




COMPREHENSIVE SOLDIER FITNESS

STRONG MINDS | STRONG BODIES

EVALUATION OF RELATIONSHIPS BETWEEN REPORTED RESILIENCE AND SOLDIER OUTCOMES

Report #2: Positive Performance Outcomes in Officers (Promotions, Selections, & Professions)

April 2011

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EVALUATION OF RELATIONSHIPS BETWEEN REPORTED RESILIENCE AND SOLDIER OUTCOMES

Report #2: Positive Outcomes (Promotions)
April 2011

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Executive Summary

This technical report presents an analysis of reported resilience and psychological health among the U.S. Army's Officer Corps. The focus of the current report is on linking resilience and psychological health (hereafter referred to as R/PH) to objective outcomes associated with high job performance.

Specifically, this report examines the statistical relationships between officer R/PH - as measured by the Army's Global Assessment Tool (GAT) - and promotions to Brigadier General, early (below zone) Field Grade Officer promotions, selections for command / key billet assignments, and officers who serve in career fields that require terminal professional degrees (e.g., medical doctors, dentists, lawyers, etc).

Results show that officers who have been promoted to Brigadier General are more emotionally and socially fit than their peers who have not received a promotion to Brigadier General. These officers are more engaged with their work, have higher levels of organizational trust and friendship, report lower levels of loneliness, are more optimistic, and report higher levels of positive affect and lower levels of negative affect. Each of these findings is in line with our expectations regarding R/PH and job performance, and the findings comport with a substantial body of work in the academic literature.

Additionally, analysis of R/PH for officers promoted early resulted in findings similar to above. In particular, those who have been promoted below zone report higher levels of work engagement, friendship, organizational trust, optimism, and coping abilities. In short, these officers score higher on the GAT dimensions of Emotional and Social Fitness than their peers who were not promoted early ("due course" officers). Similar results were found for officers selected for command for key billet assignments. They are also more emotionally and socially fit than their peers who were not selected for command (more engaged with their work, have higher levels of organizational trust and friendship, are less lonely, are more optimistic, and report higher levels of positive affect and lower levels of negative affect).

There are no practical differences in R/PH between officers serving in career fields that require terminal professional degrees and other officers serving in "line" career fields (rank-matched analysis, Captain - Colonel). In light of academic literature on the subject, this finding is somewhat surprising as it suggests that advanced professional education / training alone may not influence (or be influenced by) R/PH.

When taken together, the findings above strongly suggest there is a relationship between reported resilience and psychological health and outcomes associated with high job performance, but we are currently unable to determine causality. Stated differently, we do not know if the reported R/PH contributed to the performance outcomes, or if the high job performance outcomes contributed to the reported R/PH. Further data collection and analysis over the next 12-24 months will broaden our understanding of the relationships.

Introduction

The United States Army's Comprehensive Soldier Fitness Program (CSF) is designed to assist the Army in developing resilient Soldiers. In support of this mission, the CSF scientific staff, the University of Nebraska, and TKC Global, were broadly tasked to conduct an empirical program evaluation of the effectiveness of the CSF Program to determine if the strategies that CSF employs effectively impacts resilience and betters the psychological health of Soldiers. Results of this program evaluation will inform CSF's efforts while also assisting the Army Senior Leadership in decision making regarding the health and training of the Soldiers.

This is the second in a series of technical reports that examine the relationship between Soldier behavioral outcomes and resilience and psychological health (hereafter referred to as R/PH). In the first report (Lester, Harms, Bulling, Herian, & Spain, 2011), our team examined the relationship between Soldier resilience and three negative behavioral outcomes – suicide, illicit drug use, and violent crimes. Our analyses showed that those behaviors occurred with Soldiers who tended to be significantly less resilient and psychologically healthy than the rest of the Army.

In the current report, our team focused on positive behaviors of the Army's Officer Corps. We began with a basic program evaluation question: **Is R/PH significantly related to objective outcomes of officer performance?**

Understanding this relationship is particularly important because an emerging body of literature (e.g. Cornum, Matthews, & Seligman, 2011) continues to point to psychological resilience as a significant predictor of positive life events. Therefore, we examined the self-reported R/PH measured by the Global Assessment Tool (GAT) of officers who:

- Were promoted to Brigadier General compared to Colonels not promoted to Brigadier General.
- Were promoted early (Below Zone, or BZ) to Major, Lieutenant Colonel, and Colonel, compared to "due course" officers of the same rank.
- Were selected for a command or a key staff billet via the Centralized Selection List (CSL) compared to eligible officers not selected.
- Are in career fields that require terminal professional degrees (e.g., medical doctors, dentists, veterinarians, scientists, and lawyers) compared to officers in other career fields that do not require terminal professional degrees.

Though the results reported here show important differences between the groups compared, there is insufficient data available to determine causality. Determining causality in part requires data points prior to and following the outcomes assessed here, yet many of the outcomes included in the current report occurred long before these officers completed the GAT. We are unable at this time to determine if an officer's R/PH actually caused or contributed to the outcome, and we are likewise unable to determine if the outcome itself led to a spike or drop in an officer's reported R/PH. As such, we limited our focus on establishing the statistical relationship between officer R/PH and the outcomes of interest.

This report begins with a brief overview of the GAT and how it is administered and used. Next, we provide a literature review and logic for outcome selection. Later, we delve into data and methodology, report the results, and conclude with a general discussion section. Highlights of each section are bracketed as "Key Takeaways" to capture the major points and insights

for the reader. Appendices at the end of this report provide more in-depth information and additional statistical tables.

Overview: The Global Assessment Tool (GAT)

The GAT is a 105 question survey administered electronically to all Soldiers in the Army annually. Its purpose is to serve as a self-awareness tool for Soldiers by providing a snapshot of their R/PH along four dimensions – Emotional, Family, Social, and Spiritual Fitness. Approximately 90% of the questions included on the GAT were taken or adapted from validated measures of psychological constructs previously published in peer-reviewed scientific journals; the remaining 10% of the questions were authored by the GAT's developers (see Lester et al., 2011 for a detailed listing).

Within the four dimensions of fitness, the GAT taps into R/PH via 16 sub-scales that are indexed to one of the four dimensions. Identifiable results are reported only to the Soldier, and only as aggregate dimension scores. The measurement approach and a description of the scales used to develop each dimension of fitness are provided below, as are the reliability scores (indicated by "α"; scores over .70 indicate "good" scale reliability, Cronbach, 1951).

Emotional Fitness

Emotional Fitness is measured using an average of the mean scores on nine scales to arrive at an overall Emotional Fitness score (α=.97).

Adaptability. Three items, based on a measure of flexibility developed by Park and Peterson, were used to assess adaptability. Respondents were asked to rate how well statements describe them using a five point scale. For example, "I am good at changing myself to adjust to changes in my life" (α=.50).

Bad Coping. Three bad coping items were adapted from previous research (Peterson, et al., 2001). An example item was "I usually keep my emotions to myself." These items were also on a five point scale and were reverse scored for the analyses presented in this report (α=.71).

Good Coping. Five good coping items were adapted from previous research (Peterson, et al., 2001). An example item was "For things I cannot change, I accept them and move on" (α=.49).

Catastrophizing. Seven items were used to assess catastrophizing in the GAT. These items measured both prior flexibility ("I am good at changing myself to adjust to changes in my life") and a hopeless explanatory style ("When bad things happen to me, I expect more bad things to happen"). Respondents indicated the degree to which the statements describe them on a 1="not like me at all" to 5="very much like me" response scale. These items were reverse scored for the analyses presented in this report (α=.82).

Character. Character was assessed with the 24-item Brief Strengths Test (Peterson, 2007). Respondents indicated on a scale of 0 (never) to 10 (always) how often they showed or used several qualities in actual

situations during the past four weeks. Example qualities included teamwork and self-control (α=.96).

Depression. Ten items based on the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2001) were used to assess depression. Respondents were asked how often in the past four weeks they were bothered by any of the problems listed. Examples of the problems include "Little interest or pleasure in doing things" and "Feeling down, depressed or hopeless." A five point scale (from "not at all" to "every day") was reverse scored for the analyses presented in this report (α=.90).

Optimism. Optimism was assessed using 4 items from the Life Orientation Test (Scheier & Carver, 1985). Respondents were asked to denote on a five point anchored agree/disagree scale how the items apply to them. For example: "In uncertain times, I usually expect the best" (α=.71).

Positive Affect and Negative Affect. The Positive and Negative Affect Scale (PANAS) was used to measure typical emotions. The PANAS was developed and validated by Watson, Clark, and Tellegen (1988) to measure two fairly orthogonal dimensions – positive affect and negative affect. Respondents were asked to rate how often they have experienced specific emotions such as "joyful" or "sad" over the course of the last four weeks on a five point scale anchored with "never, hardly ever, some of the time, often and most of the time" (α=.85). The negative affect items were reverse scored for the analyses presented in this report (α=.87).

Family Fitness

Family Fitness is assessed with the Family Satisfaction and Family Support scales. The mean scores of these two scales were averaged for an overall Family Fitness score (α=.73).

Family Satisfaction. Two items were created for the GAT to assess overall family satisfaction. Those items were "How satisfied are you with your marriage/relationship?" and "How satisfied are you with your family?" Responses ranged from 1=not at all satisfied to 5=extremely satisfied. Respondents could have indicated that these items were not applicable to them (α=.76).

Family Support. Three questions from the Military Family Fitness Scale were used to assess the degree to which respondents felt that their family supported their career in the military and that the Army supported their family. Respondents were asked how strongly they agree or disagree with each statement using an anchored five point scale with a "not applicable" option. An example item was "The Army meets my family's needs" (α=.68).

Social Fitness

The four scales were used to measure Social Fitness. An average of mean scores was used to calculate an overall Social Fitness score (α=.84).

Engagement. Engagement was measured using items from the "Work as a Calling" scale (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997) and the "Orientations to Happiness" scale (Peterson, Park, & Seligman, 2005). Respondents indicated the degree to which the statements were representative of them on a scale of 1=not like me at all to 5=very much like me. An example item was "I am committed to my job" (α=.69).

Friendship. Four items relevant to friendship were created for the GAT. Three questions were Yes/No dichotomous responses to questions such as "I have a best friend." The fourth question asked "how many people are there who you can always count on if you have serious problems?" and ranges from 1=none to 5 = 4 or more (α=.73).

Loneliness. Three items from the UCLA Loneliness scale (Russell, Peplau, & Cutrona,1980) were used in the GAT. Respondents indicated how often they

experienced feelings of loneliness on a scale of 1=never to 5=most of the time. An example item of this scale was "How often do you feel left out?" These items were reverse scored for the analyses presented in this report (α=.67).

Organizational Trust. Organizational trust was assessed using five items adapted from multiple measures of organizational trust (Mayer, Davis, & Schoorman, 1995; Mayer & Davis, 1999; Sweeney, Thompson, & Blanton, 2009). Respondents were asked to indicate how much they agreed with a statement using a 1=strongly disagree to 5=strongly agree response scale. An example item was "Overall, I trust my immediate supervisor" (α=.79).

Spiritual Fitness

Spiritual strength was measured using 5 items from the Brief Multidimensional Measure of Religiousness/ Spirituality (Fetzer Institute, 1999). Respondents were asked to indicate the way they live their life on a scale from 1 (Not like me at all) to 5 (Very much like me). These items included "I am a spiritual person;" "My life has a lasting meaning;" "I believe that in some way my life is closely connected to all humanity and all the world;" "The job I am doing in the military has lasting meaning;" and "I believe there is a purpose for my life" (α=.74).

Key Takeaways

- The GAT measures R/PH along four dimensions: Emotional, Family, Social, and Spiritual Fitness.
- Within the four dimensions, the GAT taps R/PH via 16 subscales that are indexed to one of the four dimensions of fitness.
- Based on the alpha scores ($\alpha \geq .70$) the subscales used in the GAT are generally reliable.

Literature Review

The evaluation team relied upon the leadership and personality psychology literatures to frame expectations related to R/PH and GAT scores. During our review, we determined that the GAT assesses many of the constructs underlying Psychological Capital, or PSYCAP. At the construct level, PSYCAP is defined as a broad set of psychological factors that enable individuals to overcome personal, health, and occupational problems (Luthans & Youssef, 2007; Luthans, Norman, Avolio & Avey, 2008). Psychological Capital is based in part on the work of Fredrickson and colleagues' (2001) broaden-and-build theory of positive emotions. The theory posits that positive emotions lead to thoughts and behaviors that help individuals to broaden the available options for personal success and well being.

Factors which are usually associated with greater PSYCAP include hope, psychological resilience, optimism, and self-efficacy. In addition to these, a number of other constructs closely related to PSYCAP have been demonstrated to be related to successful functioning in both the workplace (Lyubomirsky, King, & Diener, 2005; Seligman, 1990) and in everyday life (Wrzesniewski, McCauley, Rozin, & Schwartz, 1997). These include traits such as positive emotionality (Lyubomirsky et al., 2005; Roberts, Caspi, & Moffitt, 2003) and lack of negative emotionality (Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003; Wells et al., 1989), job attitudes such as organizational trust (Mayer, Davis, & Schoorman, 1995), perceived leader supportiveness and organizational fairness (Organ & Ryan, 1995), and work engagement (Bakker, Schaufeli, Leiter, & Taris, 2008), as well as individual values and personality (Thomas, Dickson, & Bliese, 2001).

In addition to the research on psychological capital, an emerging body of literature in the field of personality development has demonstrated effects that are highly relevant to the assessment and development of R/PH over time. The Neo-Socioanalytic Theory of Personality Development (Roberts, Wood, & Smith, 2005; Roberts & Wood, 2006) postulates that as individuals successfully navigate important life events and invest in social institutions via work, volunteering, raising families, and religion, they will increase on a variety of positive psychological factors including emotional stability, dominance, agreeableness, and conscientiousness (Roberts, Robins, Caspi, & Trzesniewski, 2003; Roberts & Wood, 2006). Harms and colleagues (2006) note that individuals are most successful in institutions that are compatible with their needs, values, and abilities; and the attributes that influenced an individual to select a certain institution are the same attributes that will deepen over time. In essence, the characteristics that allow individuals to experience successes in their organization, or are highly valued by the organization, are the same characteristics that increase in response to successful functioning in that organization. This has been referred to as a corresponsive effect.

Our expectations regarding the relationships between R/PH and education are guided by research that has shown a positive relationship between psychological health and educational attainment. For example, Chemers (2001) found that optimism was related to academic performance and adjustment among university students. DeBerard, Spielmans, and Julka

(2004) demonstrated a relationship between good coping strategies and the likelihood of college retention. Peterson and Barrett (1987) found that positive explanatory style was positively related to grades and academic goals. And Robins, Lauver, Davis, Langley, and Carlstrom (2004) provided evidence of a relationship between social support and involvement, and college GPA and retention. Given the above, we broadly expected that:

- High performing officers would have higher levels of R/PH (as measured by the GAT) than officers not objectively identified as being high performers
- Officers in career fields that require terminal professional degrees (e.g., doctors, lawyers, etc) would have higher levels of R/PH than officers not in those professions

Outcome Selection

In searching for objective performance outcomes, we first narrowed our focus on the Army officer promotion system in order to help specify what it means to be a "high performing" officer. We specifically focused on promotions that were made by an objective body, so we therefore examined officer promotions selected via the Army's standardized promotion board process (Captain – Brigadier General). Upon review of the system, we determined that promotion rates were quite high – even when using the standardized promotion board process – where promotion rates typically ranged from approximately 50% (Colonels) to better than 98% (Captains). Diving deeper, we learned that while the promotion board objectively identifies those who meet the criteria for promotion and then rank orders the promotion list, the number of officers promoted to a given rank is set outside of the board process; this is commonly referred to as setting the promotion "cut line". Two factors (though there are more) weigh heavily on setting the cut line, and both can drive up or suppress promotion rates. First, setting the cut line is influenced by the demand for given ranks based on the Army's operational needs and mission commitments around the world. Second, setting the cut line is also influenced by the annual retention and attrition of given ranks, which will vary from year to year. So, while every officer who is promoted via this system meets the eligibility criteria, the selectivity may widely vary from year to year.

Therefore, we initially set the bar quite high and began with one of the most stringent "cuts" within the officer career lifecycle – promotion to Brigadier General. Though there are typically over 3,500 Colonels in the active duty Army, only approximately half are eligible for promotion annually. Of those who are eligible, typically only 3% are ever promoted to Brigadier General.

Next, we turned our attention to the early promotion system for Field Grade officers (Colonels, Lieutenant Colonels, and Majors). Commonly referred to as "below zone" promotions, the officers selected via this process are promoted one or two years ahead of their "due course" peers. Although any promotion typically signifies an acknowledgement of past performance and future potential, we previously noted that promotion rates for Army officers are currently quite high. Conversely, below zone promotions represent a strong indicator of objective high performance because they are uncommon, often consisting of the top 5% or less of eligible officers.

We included a third objective measure of high performance – being named to a key command or staff position via the Centralized Selection List (CSL) board. This process begins with Lieutenant Colonels or Colonels (or promotable officers to those ranks) volunteering to be considered by the board for appointment to the most critical and challenging Field Grade Officer positions in the Army. Though many officers volunteer to be considered for CSL selection, the selection rate is typically low, often only 10% of eligible officers. Therefore, officers typically named to the CSL are those who: Are personally motivated for greater responsibility and achievement; are recognized by the Army for past individual performance; and have the Army's trust that they will succeed in the most challenging future assignments.

Finally, we elected to include an objective measure of exceptional performance that typically occurs before an officer ever joins the Army – high academic achievement. Here, we focused on career fields that require terminal professional degrees, specifically medical doctors, dentists, veterinarians, scientists, and lawyers. Admittedly, some officers in these fields earn their professional degrees while serving in the Army (e.g., in route to a teaching assignment at the War College or West Point, via the Army Medical Department's Long Term Health Education Program, the Funded Legal Education Program, etc), but most officers earn these degrees before commissioning. Regardless of their chosen educational route, having a terminal professional degree – one that usually requires three or more years of post-baccalaureate work – is the prerequisite for joining these career fields.

Key Takeaways

- The GAT measures constructs associated with Psychological Capital.
- Previous research linked Psychological Capital to better employee performance.
- Previous research showed that successful people within an organization are able to adapt in order to continue to excel.
- Previous research showed that education influenced several factors associated with psychological resilience.
- Therefore:
  - » An analysis of promotions to Brigadier General, early promotion within the Field Grade ranks, and being named to the CSL are included in this report because each represents objective an outcomes of high performance within the Army's Officer Corps.
  - » An analysis of officers working in career fields that require terminal professional education is included in this report because officers in those professions typically have the highest civilian education of all Army officers.

Data & Statistical Analysis Strategy

De-identified GAT responses for all Soldiers who responded to the GAT from 2009 until the time of these analyses were made available to the analysis team. Additionally, the analysis team requested and received a series of files from the U.S. Army Human Resources Command (HRC) that contained the information of interest described previously. These databases were linked to individuals' GAT responses by a de-identified user ID field.

The analysis team initially "cleaned" the GAT data by screening out invariant responses to ensure that responses to the GAT were intentional and meaningful. Specifically, we screened out cases where participants entered the same response to all questions for the PANAS scale. The PANAS contains two subscales designed to be largely orthogonal to one another with a balanced scoring key. Consequently, an individual giving the same response to every PANAS item would be extremely improbable. It should also be noted that because the PANAS was the last component of the GAT, it was the most likely to have responses of test fatigue. The data that were left formed the primary GAT database used for this analysis. Missing data in the GAT were handled by excluding incomplete responses from the analysis (listwise deletion.)

The scales in the GAT are automatically scored to reflect higher levels of R/PH. Therefore, the scales for "negative" constructs (loneliness, depression, catastrophizing, bad coping, and negative affect) are scored so that higher scores are related to "better" responses to those questions. For example, a higher mean score on the loneliness scale is related to being less lonely; a higher mean score on depression is related to less depression, etc. We also identified that some respondents indicated that family-related items were not relevant to them. Consequently, analyses of the Family Fitness variables had a lower overall sample size.

Given the statistical power associated with the large datasets included here, the figures throughout this report present Cohen's d statistics (Cohen, 1992) in order to properly describe the practical between-group differences. This statistic allows one to determine the magnitude and relative importance of the differences between compared groups. As a rule of thumb, d scores greater than or equal to .80 are considered large in size, d scores greater than or equal to .50 but less than .80 are considered moderate in size, and d scores of greater than or equal to .20 but less than .50 are considered small yet nontrivial in size. Cohen's d scores below .20 are largely considered to be trivial effects. In some instances, our samples of interest (i.e. those selected for BZ promotions, those selected by the CSL), actually scored lower on various aspects of Soldier Fitness than the comparison groups. In these cases, the negative relationship is indicated with a negative (-) d score.

Initial Data Snapshot

The team began these analyses by determining where, along the normal distribution of GAT scores, the scores of interest tended to cluster. For example, we wanted to know the relative distribution of GAT scores for Colonels promoted early across all Colonels promoted with peers. To do so, we calculated the quartile scores for all Colonels and then simply determined the distribution of GAT scores for BZ Colonels along the quartiles. We have included the outcome of these cluster analyses for illustrative purposes in Appendix A.

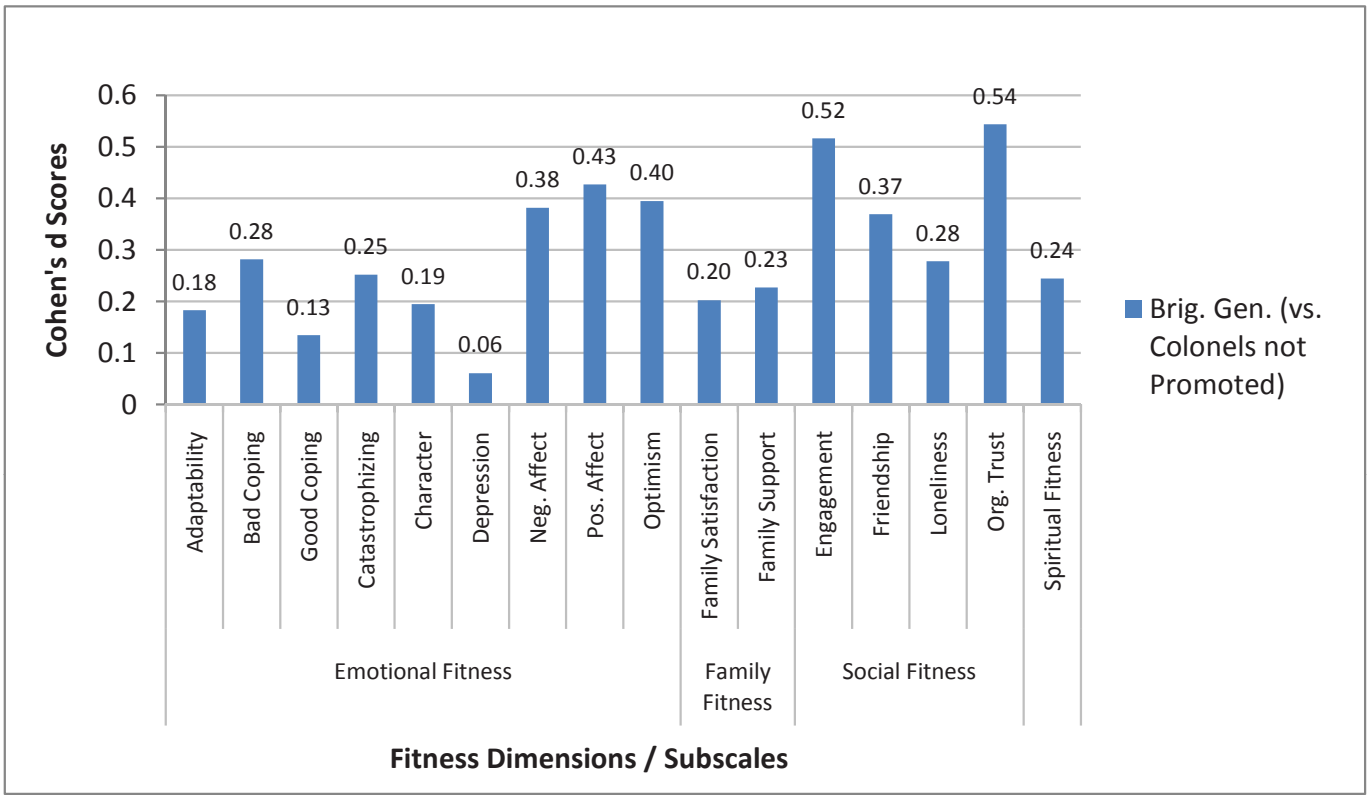
Analysis 1: Promotions to Brigadier General

Is there a relationship between promotion to Brigadier General and resilience?

We examined the relationship of promotion to Brigadier General and scores on the GAT. Here, the lead author obtained information for this analysis by contacting the Army's Human Resources Command (HRC) and requesting the names of the officers promoted to Brigadier General from 2005-2011 (n = 213). Following screening for invariant responses, we were able to successfully match 103 officers with their usable GAT responses. We compared this group of officers to 799 Colonels with completed GATs who have been in grade for 4 years or longer but have not been promoted to Brigadier General. Colonels typically complete a series of critical educational, command, and staff assignments within the first four years of becoming a Colonel, and are thus most competitive for promotion to Brigadier General after that point.

The results showed that Brigadier Generals scored significantly higher on each of the four dimensions than Colonels who were not Brigadier Generals. As Figure 1 indicates, the greatest differences between the two groups were on organizational trust and engagement. On both of these variables, there were moderate

Figure 1. Relationship between Promotion to Brigadier General and GAT Fitness Subscales



differences between Brigadier Generals and Colonels. Among the other Social Fitness variables, comparisons on friendship and loneliness also yielded meaningful differences between the two groups. There were also small differences between Brigadier Generals and Colonels on bad coping, catastrophizing, negative affect, positive affect, optimism, family satisfaction, and family support. See Appendix B, Table B-1 for additional statistics.

Key Takeaways

- Brigadier Generals display higher levels of Emotional Fitness than Colonels not promoted.
- Among the Emotional Fitness subscales, Brigadier Generals:
  - » Have significantly better coping skills
  - » Do significantly less catastrophic thinking
  - » Have significantly fewer negative emotions
  - » Have significantly more positive emotions
  - » Are significantly more optimistic
- Brigadier Generals also display higher levels of Social Fitness.
- Among the Social Fitness subscales, Brigadier Generals:
  - » Are significantly more engaged in their work
  - » Have significantly stronger friendships
  - » Are significantly less lonely
  - » Have significantly higher organizational trust in the Army
- Brigadier Generals also display higher levels of Family and Spiritual Fitness.

Analysis 2: Below Zone (BZ) Promotions

Is there a relationship between early Field Grade officer promotion and resilience?

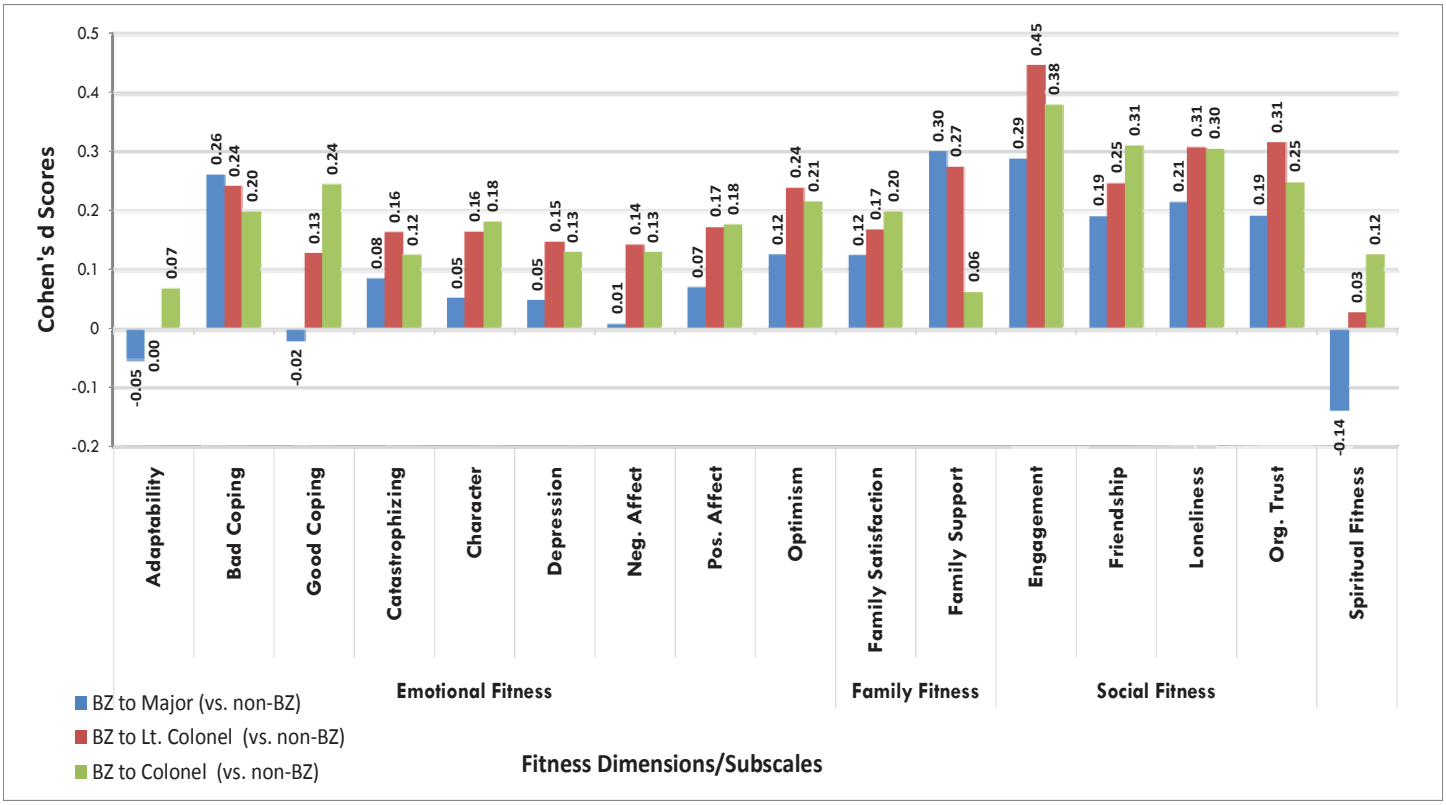
The team examined the relationship between R/PH and early (BZ) promotion to Major, Lieutenant Colonel, and Colonel. Here, we compared officers who were promoted early to those of the same rank who were promoted with peers (commonly referred to as "due course" officers). The lead author obtained information for this analysis by contacting the Army's Human Resources Command (HRC) and requesting available data on BZ promotions from 2005-2011. Records for 995 officers who were promoted BZ to Major, 568 officers who were promoted BZ to Lieutenant Colonel, and 186 officers who were promoted BZ to Colonel were available; all data were handled as previously described – identifiers were removed prior to data integration and subsequent analysis. After screening for invariant response patterns, we were able to successfully match GAT scores for 886 BZ Majors, 512 BZ Lieutenant Colonels, and 173 BZ Colonels. We conducted a rank-matched comparison to 21,955 Majors, 6,527 Lt. Colonels, and 2,339 Colonels, respectively, who never received a BZ promotion. Analysis of Variance (ANOVA) was used to calculate the dimension and subscale between-group differences at each rank. See Appendix B, Tables B-2 through B-4 for group means and significance tests.

The results of the analysis showed that, in general, BZ officers had higher reported R/PH scores on three of the four dimensions measured than their peers who were not promoted early; Spiritual Fitness did not show robust differences. Figure 2 presents the differences between the three BZ promotion groups and their "due course" peers.

BZ Promotions to Major

The blue bars in Figure 2 depict the difference scores between BZ Majors and their non-BZ peers. Based on the .2 effect size criteria described previously, we can see that there were a number of small, yet non-trivial differences between these two groups. In particular, BZ Majors reported higher levels of work engagement

Figure 2. Relationship between BZ Promotions and GAT Fitness Subscales



and family support, and lower levels of poor coping skills and loneliness.

BZ Promotions to Lieutenant Colonel

The red bars in Figure 2 represent the differences between BZ Lieutenant Colonels and their due course peers. As the red bars indicate, in most cases the differences were more pronounced, with meaningful differences (greater than .20) on bad coping, optimism, family support, engagement, friendship, loneliness, and organizational trust. The d score on engagement was quite high (.45), nearing the "moderate" range of effect size.

BZ Promotions to Colonel

Finally, the green bars in Figure 2 depict the difference scores between BZ Colonels and their non-BZ peers. As the figure shows, there were meaningful differences (greater than .20) on bad coping, good coping, optimism, family satisfaction, engagement, friendship, loneliness, and organizational trust.

In sum, the results of this analysis showed that there were meaningful differences between BZ officers and due course officers on a small number of scales used to measure Emotional Fitness (bad coping, good coping, optimism), as well as on the majority of the scales used to measure Social Fitness (engagement, friendship, loneliness, and organizational trust). Some small, inconsistent differences were seen on family satisfaction and family support, while there were no meaningful differences on Spiritual Fitness.

Key Takeaways

- Officers selected for early promotion reported higher R/PH levels compared to their "due course" peers.
  - Across all three ranks analyzed, officers promoted early consistently:
  - » Relied less on poor coping skills
  - » Were less lonely
  - » Had higher work engagement
- The widest disparity of effect sizes between ranks tended to be between Major and Lieutenant Colonel.
  - » From a between-rank perspective (BZ Major to BZ Lieutenant Colonel), this disparity may be due to the natural developmental process that occurs between promotion to Major (10 years in service) to promotion to Lieutenant Colonel (16 years in service).
  - » From a within-rank perspective (BZ Major vs. due course Major compared to BZ Lieutenant Colonel vs. due course Lieutenant Colonel), this disparity may also signal that – over time – the resilience and psychological health gulf widens between elite performers and "due course" officers
    - *If true, the expanding gulf may be due to elite performers being exposed to the best, most developmental opportunities earlier than their peers (if their peers get the same exposure at all).*
    - *Early exposure to these opportunities likely affords these officers more time to reflect and make meaning of their experiences, thereby reinforcing and perhaps expanding their self-perceptions of their resilience and psychological health.*
    - *Therefore, early exposure to these opportunities may serve as a resilience protective factor (provided that these officers are successful) that compounds as they move through their career.*
      - » More analysis in the future will be required to empirically establish this relationship.

Analysis 3: Selection for a Centralized Selection List (CSL) Key Billet

Is there a relationship between being selected for a key assignment via the CSL and resilience?

Next, we examined the relationship between reported R/PH and selection for a key assignment via the CSL. Our team received de-identified R/PH information on 1,350 officers selected for key billets via the CSL from 2005 to 2011. After screening for invariant response patterns, we were able to match GAT scores for 1,245 officers. We first compared this sample to 5,556 Lieutenant Colonels and Colonels (combined) who were not selected for command. We then compared separately the 869 Lieutenant Colonels selected for command to the 3,450 Lieutenant Colonels not selected, as well as compared separately the 373 Colonels selected for command to the 2,106 Colonels not selected for command.

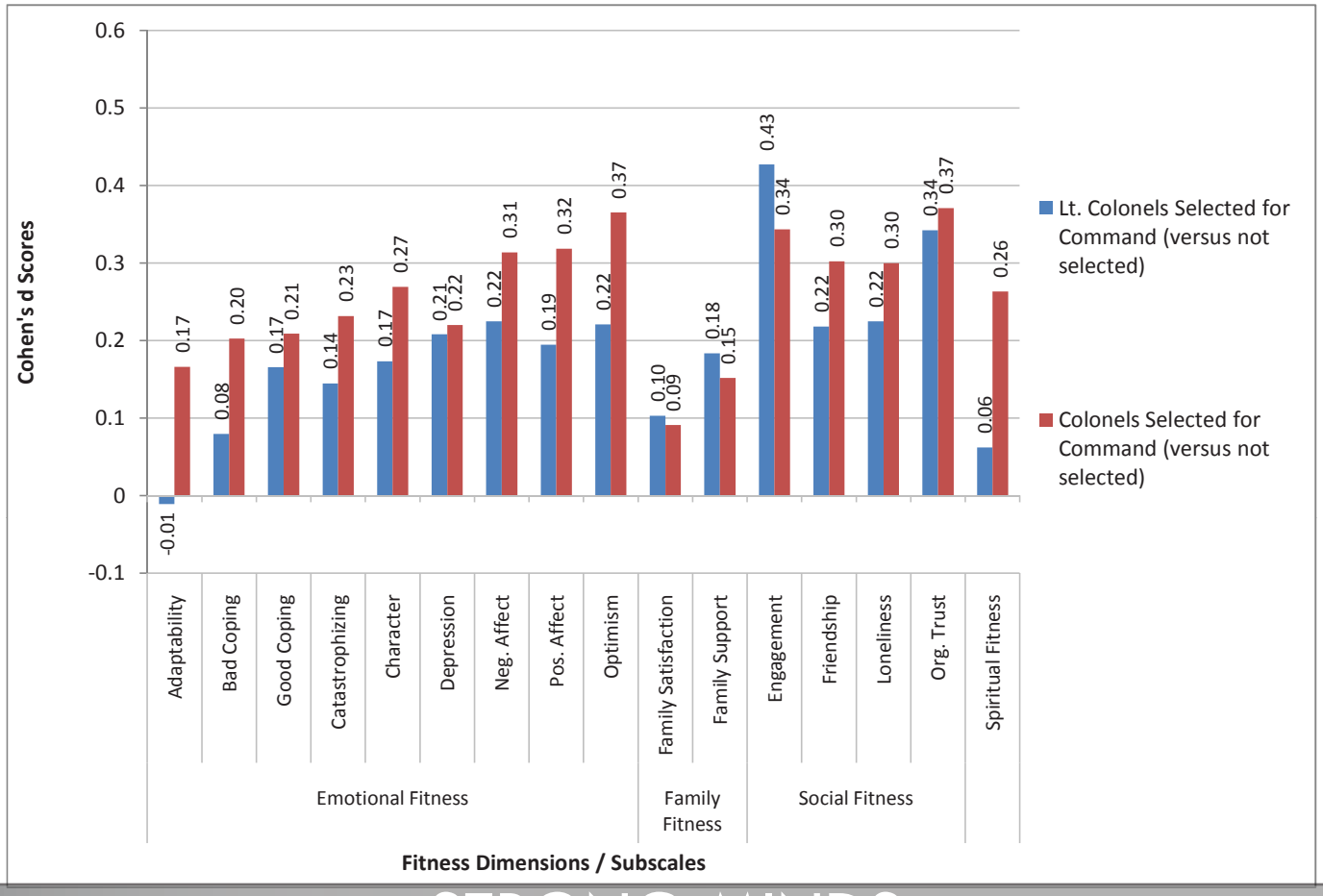
Overall, officers on the CSL scored significantly higher on all four dimensions of R/PH than those not selected for command. See Appendix B, Table B-5 for statistics.

Additionally, subscale analyses indicated that those officers on the CSL scored higher on fifteen of the sixteen subscales than did those not on the CSL. The only exception was the Emotional Fitness subscale of adaptability which showed no significant difference. Of the statistically significant differences, depression, positive and negative affect, optimism, engagement, friendship, loneliness, and organizational trust were the subscales with practical significance that yielded with small-to-moderate effect sizes.

Lieutenant Colonel Analysis

Next, the analyses were repeated for Lieutenant Colonels only (n = 869 Lieutenant Colonels on the CSL; n = 3,450 Lieutenant Colonels not on the CSL). Lieutenant Colonels on the CSL had higher scores than those officers not on the CSL on three of the four Fitness Dimensions (Emotional, Family, and Social Fitness), See Appendix B, Table B-6 for means and additional statistics. We found no significant between-group differences on Spiritual Fitness. All subscales contributed to the differences in the Emotional, Family, and Social Fitness dimensions except

Figure 3. Relationship between CSL Selection GAT Fitness Subscales



for adaptability. Once again, d scores were computed and we observed a number of meaningful differences between the two groups on the Social Fitness subscales. The greatest differences, as indicated by the d scores, were on engagement and organizational trust. See Figure 3.

Colonel Analysis

The analyses above were replicated using Colonels (n = 373 Colonels on the CSL; n = 2,106 Colonels not on the CSL). Colonels on the CSL scored significantly higher than those not on the CSL on all four dimensions of the GAT, with "small" effect sizes found for Emotional, Social, and Spiritual Fitness dimensions. See Appendix B, Table B-7 for means and additional statistics. Figure 3 illustrates the subscale level results. There were significant and meaningful mean differences on eight of the nine scales used to measure Emotional Fitness. In particular, there were notable differences between the two groups on negative affect, positive affect, and optimism. Once again, there were meaningful differences between the two groups on the four Social Fitness subscales. The differences on Family Fitness subscales, while significant, were not meaningful.

Key Takeaways

- Officers selected for key assignments via the CSL report higher R/PH levels in most areas than officers not selected.
- The results largely hold when the analysis is restricted to only Lieutenant Colonels or only Colonels.
- From a within-rank perspective, the differences at the Colonel level are much more distinct than the differences at the Lieutenant Colonel level
  - » This distinction may be attributed to the CSL's "culling effect," particularly at the Colonel level.
  - » Colonels on the CSL know that CSL selection means that they are still competitive for further promotion.
  - » The large between-rank difference within the Spiritual Fitness dimension is also a major distinction and particularly noteworthy.
  - » As previously outlined, the Spiritual Fitness dimension focuses on one's ability to find purpose and meaning in life.
  - » Here, Colonels on the CSL reported having significantly greater purpose and meaning in life than:
    - *Other Colonels who are <u>not</u> on the CSL*
    - *Lieutenant Colonels who are <u>not</u> on the CSL*
    - *Lieutenant Colonels who <u>are</u> on the CSL*
  - » This disparity is likely related to several factors, a few of which may be:
    - *The purpose of the CSL is to identify the best leaders for critical billets, so – after two decades of service – most Colonels on the CSL likely equate their purpose and meaning in life to serving as a leader in such positions. In short, their "payoff" for a lifetime of service is being allowed to serve in a leadership position where they derive the greatest purpose and meaning.*
    - *Though not expressly "strategic leaders," Colonels on the CSL are able to enact or frame significant policies that impact large numbers of Soldiers, which in turn fuels their ability to find purpose and meaning in their life. In short, they know that they are making a positive difference.*
    - *To be named to the CSL, Colonels must have a proven track record throughout their careers, which likely inflates their perceptions of their self-efficacy, which in turn may lead to them responding to the questions more confidently.*

Analysis 4: Advanced Education (Terminal Professional Degrees)

Is there a relationship between exceptional academic achievement and resilience?

For this analysis, we narrowed our search to only officers who held ranks of Captain – Colonel. These ranks were used because nearly all officers from the professions of interest are directly commissioned as Captains and typically are promoted no higher than Colonel. From these records, the team identified 4,576 medical doctors; 1,241 dentists; 552 veterinarians; 551 scientists; and 2,358 lawyers who provided reliable GAT scores following data cleaning. We next compared the GAT scores from each group independently to 70,638 Officers of the correct rank and who were not members of the professions listed above.

Overall, the findings were generally mixed and no clear pattern of differences emerged. We once again computed Cohen's d statistic and, as Table 1 shows, the average d score falls into the "trivial" range, so small that in most cases they approached zero. Although no pattern emerged from the data, we discuss the findings related to each profession in slightly greater detail in Table 1.

Table 1. Career Fields Requiring Terminal Professional Degrees

	Min. d Score	Max. d Score	Avg. d Score
Medical Doctors	-.05	.20	.05
Dentists	-.06	.13	.04
Veterinarians	-.23	.04	-.12
Scientists	-.39	.31	.04
Lawyers	-.24	.11	-.03
Avg. Across Career Fields	-.19	.15	-.00

Overall, the findings were generally mixed and no clear pattern of differences emerged. We once again computed Cohen's d statistic and, as Table 1 shows, the average d score falls into the "trivial" range, so small that in most cases they approached zero. Although no pattern emerged from the data, we discuss the findings related to each profession in slightly greater detail next.

Medical Doctors

We compared the GAT scores of 4,576 medical doctors to 70,638 officers who were not in our list of professions and who held the correct rank (comparison group). The only subscale of the GAT that showed a meaningful difference was that doctors scored higher on engagement (d = .20). See Appendix B, Table B-8 for means and additional statistics.

Dentists

We compared the GAT scores of 1,241 dentists to the comparison group. Across all of the subscales of the GAT, there were no meaningful differences between dentists and the comparison group. See Appendix B, Table B-9 for means and additional statistics.

Veterinarians

We compared the GAT scores of 552 veterinarians to the comparison group. Of the GAT subscales, meaningful differences between veterinarians and non-veterinarians were found for positive affect and loneliness with veterinarians scoring significantly lower on both dimensions. See Appendix B, Table B-10 for additional statistics.

Scientists

We compared the GAT scores of 551 scientists to the comparison group. Four of the GAT subscales showed meaningful differences between scientists and the comparison group. Scientists scored significantly higher on good coping, optimism and spiritual fitness but lower on family support than the comparison group. See Appendix B, Table B-11 for means and additional statistics.

Lawyers

We compared the GAT scores of 2,358 lawyers to the comparison group. Across the subscales of the GAT, only the family support dimension showed meaningful differences between lawyers and the comparison group, with lawyers scoring significantly lower. See Appendix B, Table B-12 for means and additional statistics.

Key Takeaways

- There are no pattern of differences between officers who in career fields requiring terminal degrees and officers who work in career fields that do not require advanced professional degrees.
- Despite the scientific literature linking resilience to advanced education, the evidence reported here suggests that this may not be the case for Army officers.
- The relative R/PH parity between officers with and without advanced professional education may mean that that:
  - » Being resilient and psychologically healthy may be less about pure motivation or intelligence – both of which heavily influence academic achievement.
  - » Rather – consistent with the CSF training program – being resilient and psychologically healthy may rely more heavily one's ability to process and make meaning of events, a skill that can be learned formally in educational settings or informally in training and operational settings.
  - » Further research is warranted to establish granularity of these relationships.

General Discussion

Our analysis team examined the relationship between resilience and psychological health and several positive objective outcomes related to job performance within the Army's Officer Corps. Specifically, we used GAT scores as a proxy for resilience and psychological health (R/PH) to examine four outcomes: promotion to Brigadier General; early (below zone) promotions of Field Grade officers; key command and staff assignment via the Centralized Selection List (CSL); and attaining high academic achievement. We included these outcomes because we believed that each represented high individual performance and motivation, and we expected to see significantly higher R/PH levels in high performing and motivated officers included in this report. Our initial expectations were largely supported.

Promotions and Selections

We found stark differences between Brigadier Generals and the Colonels eligible for, but not promoted to Brigadier General. Here, we discovered that Brigadier Generals tended be much more engaged with their work, had stronger friendships, were less lonely, and tended to trust the Army more. Likewise, they tended to be more optimistic, rely less on negative coping strategies, and tended to frame negative events in less catastrophic terms. When taken together, these findings are not at all surprising given that Flag Grade officers – the Generals – are the strategic leaders within the Army. General officers make up only approximately 0.05% of the Active component of the Army, suggesting that the Army's process of identifying strategic leaders is extremely selective. All have been tested – repeatedly – in the most challenging assignments the Army has to offer. Most are working well past their eligible retirement date, which supports the notion that strategic leaders tend to be highly engaged in their work, are likely intrinsically motivated to succeed individually, and have a vested interest in seeing the Army succeed because these officers lead it. After all, because these officers operate at the strategic level of the Army, the Army's success and their personal success is in many ways one and the same.

We found a similar pattern of results at the Field Grade officer level when we examined early promotions. The most notable consistency was that officers promoted early were distinguished from their peers on the Social Fitness dimension and the dimension's subscales, particularly in work engagement, friendship, loneliness, and organizational trust. When coupled with the findings from the Brigadier General analysis, there appears to be a strong social component to promotions, such that those who are identified as elite performers tend to have strong social connections with their work, peers, families, and friends. This was particularly true for aspects of the work-relevant areas (i.e. engagement and organizational trust).

The pattern of results continued in a similar fashion when we analyzed the reported R/PH of officers on the Centralized Selection List (CSL). Our analysis showed that these officers have higher levels of reported R/PH than their peers not on the CSL. Specifically, these officers report higher levels of optimism, organizational trust, and engagement. The between-group difference in optimism is especially noteworthy given that the officers on the CSL score nearly ½ a standard deviation above their peers (d = .46). Individuals not selected via the CSL tended be more depressed and have more negative affect. Once again, these findings are not surprising because selection by the CSL is a significant

stepping stone to greater responsibility in the Army. Likewise, being named to the list is an acknowledgement by the Army that those selected are to be trusted and have the skills, knowledge, and abilities to be successful in the most challenging Field Grade assignments across the Army. At the individual officer level, being named to the list also represents a validation of two decades or more of hard work and the attainment of a significant career goal.

Academic Achievement

The results from these analyses were much more ambiguous. We anticipated that high academic achievers – those officers who worked in career fields that required terminal professional degrees – would report higher R/PH. However, we found no appreciable differences in R/PH between these officers and officers who serve in career fields more commonly associated with the Army (Infantry, Field Artillery, Aviation, etc) that do not require such high education. This suggests that – despite previous research – education alone may have little influence on R/PH, though more granular analyses are needed in order to examine the effect of education at differing levels (e.g., high school vs. Associates degree vs. Bachelors degree).

Summary

When taken together, a few key points emerge. First, the results reported here suggest there is a very real and practical relationship between resilience and psychological health and high performance among the U.S. Army's Officer Corps. Although the differences reported here appear to be small-to-moderate in size, the differences are nevertheless meaningful. The officers fortunate enough to be promoted to a high level, to be promoted ahead of their peers, or to be centrally selected for increased responsibility are benefiting in some way from their greater resilience and psychological health, and the real benefits likely far outpace the outcomes examined in this report. Therefore, our findings serve to highlight the relevancy of the Comprehensive Soldier Fitness Program because the program is designed to develop these key areas of strength in all Soldiers – officers and enlisted alike.

Second, though resilience is not a prerequisite for promotion or selection, it appears that as a group, high performing Army officers are among the most resilient members of the Army. It is a long-standing practice in organizations – military and civilian alike – to identify and select the best performers for the most challenging jobs, and the Army is no exception. The data presented here provides the Army Senior Leadership with yet another triangulation point suggesting that they are selecting from among best and brightest – and most resilient – leaders for greater responsibility.

Third, the results reported here suggest that resilience and psychological health are not limited to the most academically motivated or educated officers within the Army. Our lack of significant findings here is heartening from a strategic standpoint. As the Army closes on a decade of protracted war, a debate is beginning to emerge about what it means to be a professional soldier – a member of the "Profession of Arms." The current Army Chief of Staff contends that being a professional Soldier is not unlike being a member of any other exceptional profession that is highly regarded by society, requiring both service to a higher calling or standard and the attainment of expert knowledge. At least within the limits of resilience and psychological health, we believe that our findings support his view because we can find no difference in resilience and psychological health between those who are in recognized professions and officers from the "line" Army. Stated another way, it

appears that the Army's "line" officers are generally as resilient and psychologically healthy as their professionally educated peers.

Fourth, these results are merely a "jumping off" point

for future analyses that may in fact be more revealing. More data collection and analysis are required before we can draw substantial conclusions. As previously stated, we cannot make causal inferences at this time. Specifically, we do not know if the promotions and selections described here led to officers reporting higher R/PH, or if the R/PH actually contributed in any way to the officer being promoted or selected for higher responsibility, because we currently lack longitudinal data on most outcomes of interest. Likewise, at this time we do not know if a single variable (e.g., engagement or optimism) is the key to being promoted or selected, or if it is a constellation of variables that work together to positively (or negatively) impact such outcomes. Our team intends to do such analyses within the next 12-24 months. Limitations aside, this report nevertheless provides yet another important data point in what we know about high performance among the Army's Officer Corps and its relationship to resilience and psychological health.

Key Takeaways

- Army officers identified as elite performers consistently report significantly higher resilience and psychological health levels than other officers.
- There appears to be no significant link between resilience and psychological health and high academic achievement, though more granular analyses are needed to examine all levels of formal education.
- More analyses are planned over the next year or two that will help determine the causal relationship between resilience and psychological health, promotion and selection, and formal education.

References

Bakker, A.B., Schaufeli, W.B., Leiter, M.P., & Taris, T.W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress, 22,* 187-200.

Chemers, M.M., Hu, L. & Garcia, B.F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology, 93,* 55-64.

Cornum, R., Matthews, M.D., & Seligman, M.E.P. (2011). Comprehensive Soldier Fitness: Building resilience in a challenging institutional context. *American Psychologist, 66,* 4-9.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16,* 297-334.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Deberard, M.S., Spielmans, G.I., & Julka, D.L. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal, 38*, 66-81.

Fetzer Institute/National Institute on Aging. (1999). *Multidimensional measurement of religiousness/spirituality for use in health research: A report of the Fetzer Institute/ National Institute on Aging Working Group*. Kalamazoo, MI: John E. Fetzer Institute.

Fredrickson, B.L. (2001). The role of positive emotions in positive psychology. *American Psychologist, 56,* 218-226.

Harms, P.D., Roberts, B.W., & Winter, D. (2006). Becoming the Harvard man: Person-environment fit, personality development, and academic success. *Personality and Social Psychology Bulletin, 32*, 851-865.

Kroenke, K., Spitzer, R. L. Williams, J.B.W. (2001). The PHQ-9. JGIM: *Journal of General Internal Medicine, 16,* 606-613.

Lester, P.B., Harms, P.D., Bulling, D.J., Herian, M.N., & Spain, S.M. (2011). Evaluation of relationships between reported resilience and soldier outcomes. Report # 1: negative outcomes (suicide, drug use, and violent crimes), February, 2011. Available from: www.dtic.mil.

Luthans, F., Norman, S.M., Avolio, B.J., & Avey, J.B. (2008). The mediating role of psychological capital in the supportive organizational climate-employee performance relationship. *Journal of Organizational Behavior, 29*, 219-238.

Luthans, F. & Youssef, C.M. (2007). Emerging positive organizational behavior. *Journal of Management, 33*, 321-349.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*, 803-855.

Mayer, R. C. & Davis, J. H. (1999). The effect of the performance appraisal system on trust for management: A field quasi-experiment. *Journal of Applied Psychology, 84*, 123-136.

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734.

Organ, D. W. & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology, 48*, 775-802.

Peterson, C. (2007). Brief Strengths Test. Cincinnati: VIA Institute.

Peterson, C., & Barrett, L.C. (1987). Explanatory style and academic performance among university freshmen. *Journal of Personality and Social Psychology, 53*, 603-607.

Peterson, C., Bishop, M. P., Fletcher, C. W., Kaplan, M. R., Yesko, E. S., Moon, C. H.,…Michaels, A. J. (2001). Explanatory style as a risk factor for traumatic mishaps. *Cognitive Therapy and Research, 25*, 633-649.

Peterson, C., Park, N. & Seligman, M.E.P. (2005). Orientations to happiness and life satisfaction: The full life versus the empty life. *Journal of Happiness Studies 6*, 25-41.

Robbins, S.B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? *A meta-analysis. Psychological Bulletin, 130*, 261-288.

Roberts, B.W., Caspi, A., & Moffitt, T.E. (2003). Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology, 84*, 582-593.

Roberts, B.W., Robins, R.W., Trzesniewski, K. & Caspi, A. (2003). Personality trait development in adulthood. In J. Mortimer & M. Shanahan (Eds.), *Handbook of the life course* (pp. 579-598). New York, NY: Kluwer Academic.

Roberts, B. W. & Wood, D. (2006). Personality development in the context of the Neo-Socioanalytic Model of personality. In D. Mroczek & T. Little (Eds.), *Handbook of personality development* (pp. 11-39). Mahwah, NJ: Lawrence Erlbaum Associates.

Roberts, B.W., Wood, D., & Smith, J.L. (2005). Evaluating Five Factor Theory and social investment perspectives on personality trait development. *Journal of Research in Personality, 39*, 166-184.

Russell, D., Peplau, L. A., & Cutrona, C.E. (1980). The Revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence." *Journal of Personality and Social Psychology 39*, 472-480.

Scheier, M. F. & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology 4,* 219-247.

Seligman, M.E.P. (1990). *Learned optimism*. New York, NY: Knopf.

Sweeney, P. J., Thompson, V., & Blanton, H. (2009). Trust and influence in combat: An interdependence model. *Journal of Applied Social Psychology 39,* 235-264.

Thomas, J.L., Dickson, M.W., & Bliese, P.D. (2001). Values predicting leader performance in the U.S. Army Reserve Officer Training Corps Assessment Center: Evidence for a personality-mediated model. *The Leadership Quarterly, 12*, 181-196.

Thoresen, C.J., Kaplan, S.A., Barsky, A.P., Warren, C.R., & de Chermont, K. (2003). The affective underpinnings of job perceptions and attitudes: A meta-analytic review and integration. *Psychological Bulletin, 129*, 914-945.

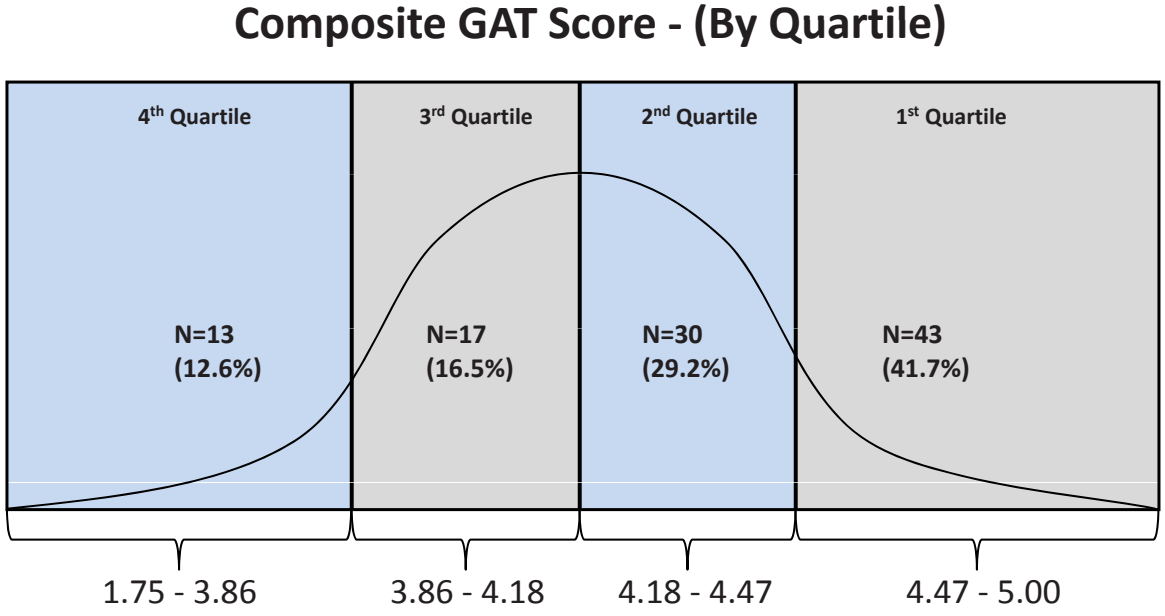
Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-1070.

Wells, K.B., Stewart, A., Hays, R.D., Burnam, M.A., Rogers, W., Daniels, M.,...& Ware, J. (1989). The functioning and well-being of depressed patients: Results from the Medical Outcomes Study. *Journal of the American Medical Association, 262,* 914-919.

Wrzesniewski, A., McCauley, C., Rozin, P., & Schwartz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of Research in Personality, 31*, 21-33.

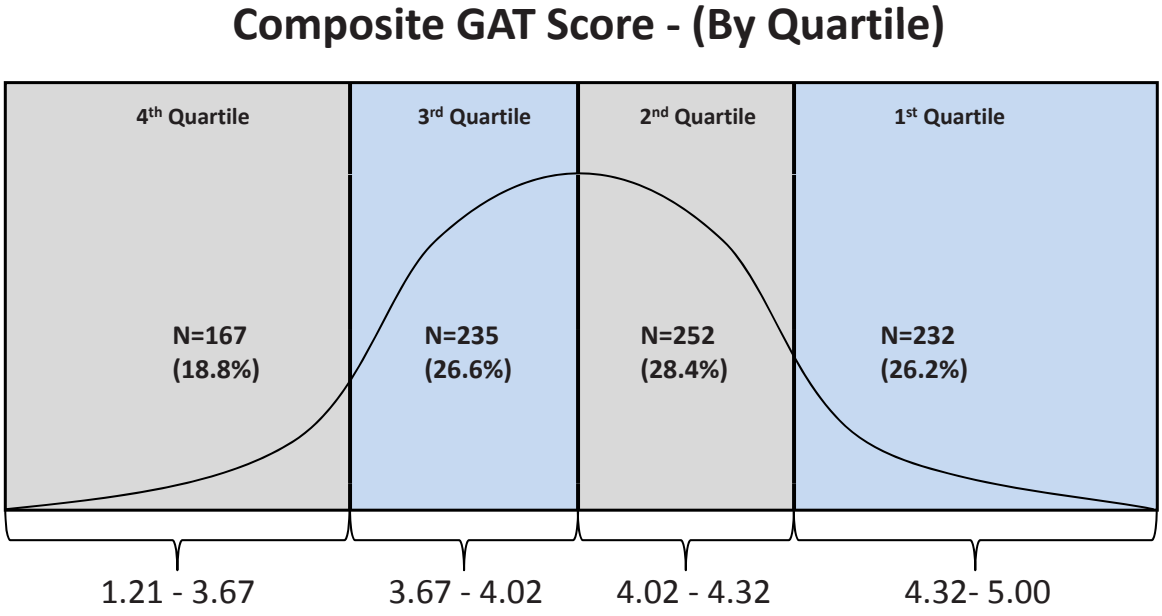
APPENDIX A – Quartile Distributions of Composite GAT Scores

Figure A-1. Composite GAT Quartile Distributions of Promotions to Brigadier General



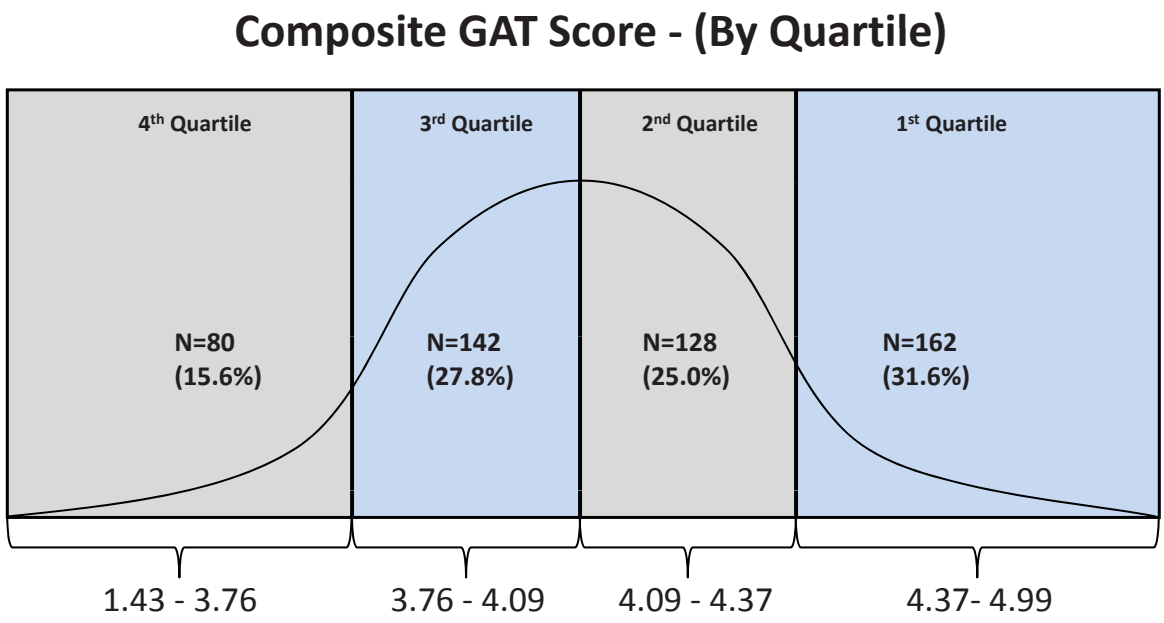
Promote to Brigadier General: N=103
- **41.7% in Top Quartile**
- **70.9% in Top 2 Quartiles**

Figure A-2. Composite GAT Quartile Distributions of Below Zone Promotions to Major



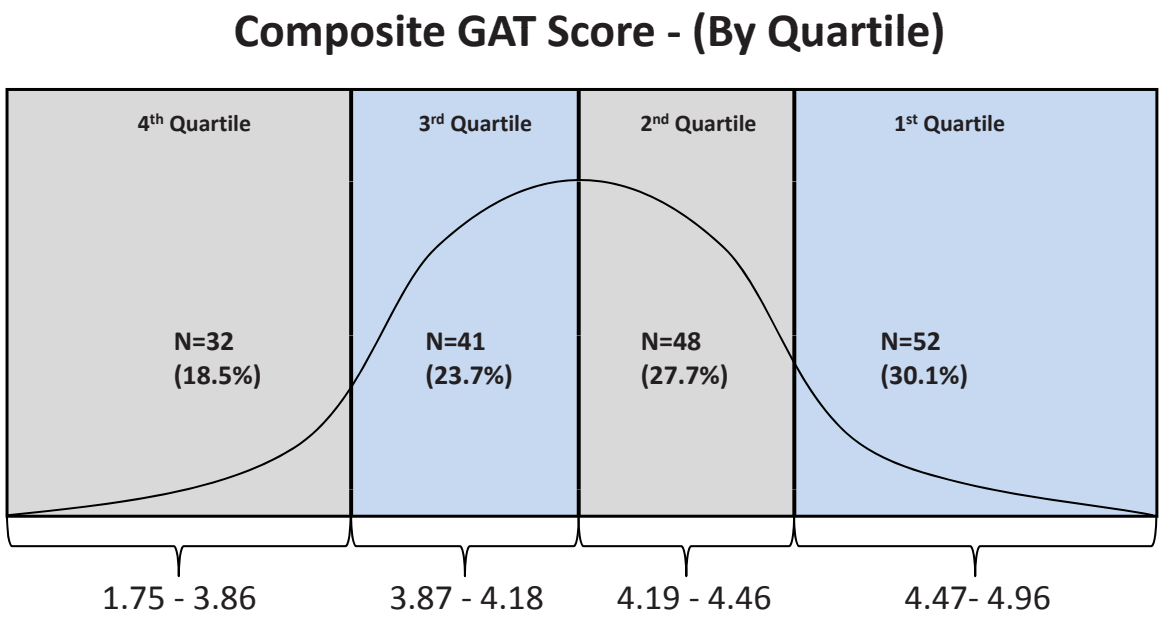
BZ to Major: N=886
- **26.2% in Top Quartile**
- **54.6% in Top 2 Quartiles**

Figure A-3. Composite GAT Quartile Distributions of Below Zone Promotions to Lt. Colonel



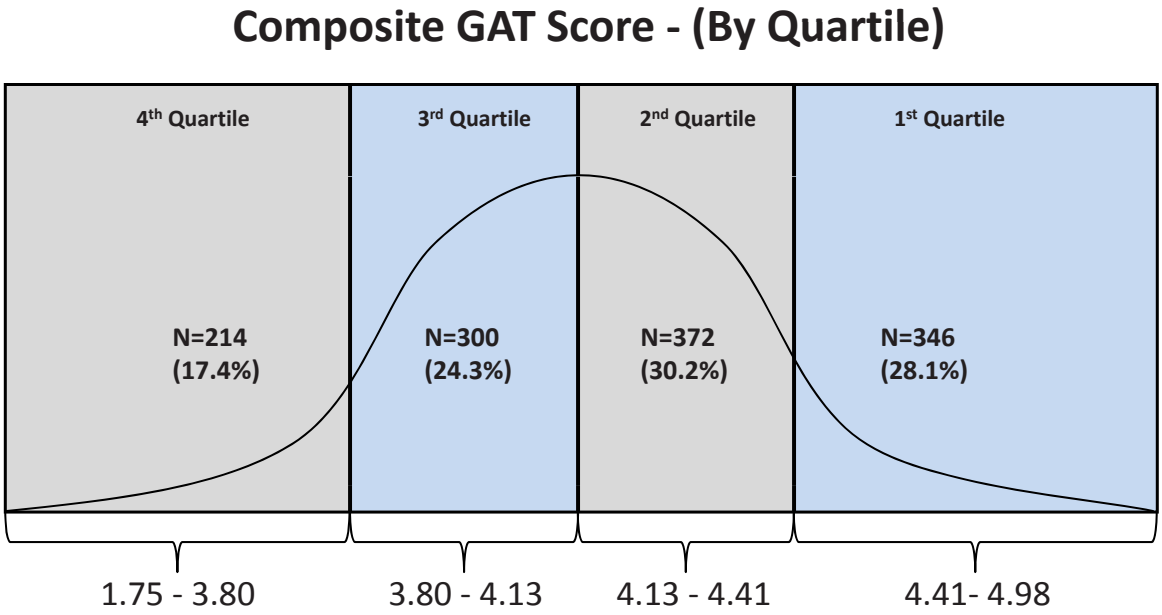
BZ to Lt. Colonel: N=512
- **31.6% in Top Quartile**
- **56.6% in Top 2 Quartiles**

Figure A-4. Composite GAT Quartile Distributions of Below Zone Promotions to Colonel



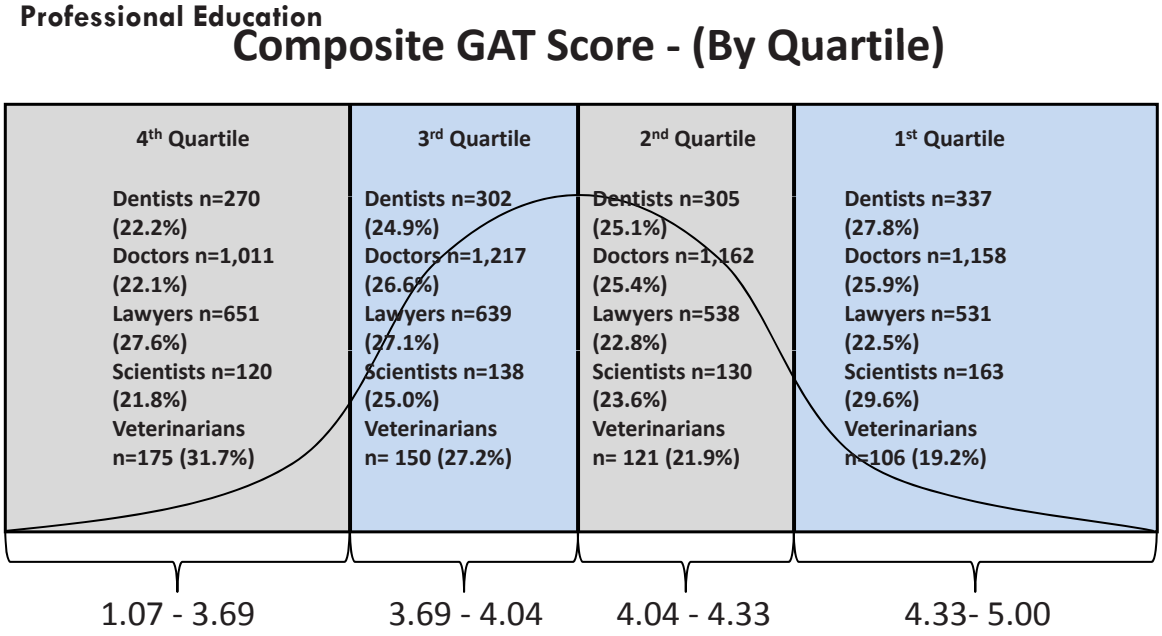
BZ to Colonel: N=173
- **30.1% in Top Quartile**
- **57.8% in Top 2 Quartiles**

Figure A-5. Composite GAT Quartile Distributions of Officers Selected for Command



Selection for Command: N=1,232
- **28.1% in Top Quartile**
- **58.3% in Top 2 Quartiles**

Figure A-6. Composite GAT Quartile Distributions of Career Fields Requiring Terminal Professional Education



Dentists: N=1,214 (27.8% in Top Quartile; 52.9% in Top 2 Quartiles)
Doctors: N=4,576 (25.9% in Top Quartile; 51.3% in Top 2 Quartiles)
Lawyers: N=2,358 (22.5% in Top Quartile; 45.3% in Top 2 Quartiles)
Scientists: N=551 (29.6% in Top Quartile; 53.2% in Top 2 Quartiles)
Veterinarians: N=552 (19.2% in Top Quartile; 41.1% in Top 2 Quartiles)

Table B-1. Relationship between Promotion to Brigadier General and Fitness Dimensions/Subscales

	No Promotion†		Promotion to Brig. Gen.‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	4.05	0.47	4.19	0.42	0.14	7.878	.005	0.32
Adaptability	3.90	0.76	4.02	0.66	0.12	2.504	.114	0.17
Bad Coping	3.68	0.74	3.86	0.65	0.19	6.104	.014	0.26
Good Coping	3.67	0.51	3.74	0.42	0.08	2.080	.150	0.15
Catastrophizing	4.21	0.52	4.36	0.47	0.15	7.707	.006	0.29
Character	4.05	0.66	4.15	0.57	0.10	2.161	.142	0.15
Depression	4.58	0.53	4.60	0.53	0.02	0.183	.669	0.04
Negative Affect	3.88	0.53	4.08	0.51	0.20	13.572	.000	0.38
Positive Affect	3.94	0.52	4.15	0.47	0.21	15.410	.000	0.41
Optimism	4.12	0.70	4.41	0.53	0.29	16.461	.000	0.42
Family Fitness	4.50	0.56	4.63	0.45	0.13	4.777	.029	0.28
Family Satisfaction	4.45	.97	4.60	0.78	0.15	2.354	.125	0.16
Family Support	4.51	0.60	4.62	0.47	0.11	3.239	.072	0.19
Social Fitness	4.21	0.50	4.49	0.37	0.28	29.943	.000	0.58
Engagement	4.29	0.60	4.56	0.44	0.28	20.915	.000	0.47
Friendship	4.26	0.60	4.47	0.46	0.22	12.216	.000	0.36
Loneliness	4.00	0.61	4.17	0.60	0.17	6.912	.009	0.27
Org. Trust	4.07	0.68	4.44	0.50	0.37	28.879	.000	0.55
Spiritual Fitness	3.73	0.78	3.92	0.66	0.19	5.564	.019	0.25

†n=749-799; ‡n=102-103

Table B-2. Relationship between BZ Promotion to Major and Fitness Dimensions/Subscales

	No BZ to Major†		BZ to Major‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.93	0.51	3.96	0.47	0.04	4.538	.033	0.07
Adaptability	3.83	0.75	3.79	0.72	-0.04	2.287	.131	-0.05
Bad Coping	3.46	0.81	3.67	0.67	0.21	57.826	.000	0.26
Good Coping	3.64	0.55	3.63	0.49	-0.01	.283	.595	-0.02
Catastrophizing	4.12	0.61	4.17	0.57	0.05	6.066	.014	0.08
Character	3.91	0.72	3.94	0.65	0.04	2.174	.140	0.05
Depression	4.48	0.65	4.51	0.59	0.03	1.943	.163	0.05
Negative Affect	3.77	0.58	3.77	0.54	0.00	.043	.836	0.01
Positive Affect	3.76	0.63	3.81	0.54	0.04	4.028	.045	0.07
Optimism	3.93	0.78	4.03	0.72	0.10	13.090	.000	0.12
Family Fitness	4.23	0.67	4.41	0.59	0.18	63.463	.000	0.27
Family Satisfaction	4.32	1.02	4.45	0.95	0.13	12.128	.000	0.12
Family Support	4.17	0.77	4.40	0.62	0.23	76.315	.000	0.30
Social Fitness	4.00	0.55	4.15	0.50	0.15	63.315	.000	0.27
Engagement	3.95	0.70	4.15	0.62	0.20	70.639	.000	0.29
Friendship	4.15	0.67	4.27	0.58	0.13	30.842	.000	0.19
Loneliness	3.88	0.71	4.03	0.66	0.15	39.089	.000	0.21
Org. Trust	3.83	0.74	3.97	0.69	0.14	31.295	.000	0.19
Spiritual Fitness	3.66	0.82	3.55	0.73	-0.11	15.825	.000	-0.14

†n=20,354-21,955; ‡n=827-886

Table B- 3. Relationship between BZ Promotion to Lieutenant Colonel and Fitness Dimensions/Subscales

	No BZ to Lt. Colonel†		BZ to Lt. Colonel‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.96	0.49	4.06	0.42	0.10	20.028	.000	0.21
Adaptability	3.85	0.73	3.85	0.73	0.00	.000	.996	0.00
Bad Coping	3.54	0.77	3.73	0.65	0.18	27.486	.000	0.24
Good Coping	3.65	0.53	3.72	0.46	0.07	7.564	.006	0.13
Catastrophizing	4.18	0.57	4.27	0.51	0.09	12.501	.000	0.16
Character	3.93	0.70	4.05	0.59	0.11	12.622	.000	0.16
Depression	4.50	0.61	4.58	0.50	0.09	10.174	.001	0.15
Negative Affect	3.80	0.56	3.88	0.50	0.08	9.522	.002	0.14
Positive Affect	3.82	0.59	3.92	0.50	0.10	14.049	.000	0.17
Optimism	4.02	0.75	4.19	0.64	0.18	27.040	.000	0.24
Family Fitness	4.36	0.62	4.52	0.50	0.17	35.105	.000	0.27
Family Satisfaction	4.36	1.00	4.53	0.86	0.16	12.430	.000	0.17
Family Support	4.34	0.68	4.53	0.52	0.18	35.639	.000	0.27
Social Fitness	4.08	0.54	4.29	0.44	0.21	76.620	.000	0.39
Engagement	4.04	0.68	4.34	0.53	0.30	95.616	.000	0.45
Friendship	4.19	0.64	4.35	0.53	0.16	28.960	.000	0.25
Loneliness	3.93	0.68	4.14	0.58	0.21	45.176	.000	0.31
Org. Trust	3.94	0.73	4.17	0.63	0.23	47.311	.000	0.31
Spiritual Fitness	3.69	0.79	3.71	0.72	0.02	.327	.567	0.03

†n=6,132-6,527; ‡n=483-512

Table B-4. Relationship between BZ Promotion to Colonel and Fitness Dimensions/Subscales

	No BZ to Colonel†		BZ to Colonel‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	4.03	0.48	4.13	0.42	0.10	6.848	.009	0.21
Adaptability	3.90	0.73	3.95	0.68	0.05	.714	.398	0.07
Bad Coping	3.66	0.74	3.81	0.67	0.15	6.319	.012	0.20
Good Coping	3.66	0.49	3.78	0.46	0.12	9.552	.002	0.24
Catastrophizing	4.23	0.54	4.29	0.58	0.07	2.463	.117	0.12
Character	4.01	0.65	4.12	0.51	0.12	5.273	.022	0.18
Depression	4.54	0.58	4.62	0.58	0.07	2.642	.104	0.13
Negative Affect	3.87	0.56	3.94	0.48	0.07	2.657	.103	0.13
Positive Affect	3.92	0.57	4.02	0.55	0.10	4.992	.026	0.18
Optimism	4.13	0.73	4.29	0.64	0.16	7.441	.006	0.21
Family Fitness	4.48	0.58	4.55	0.52	0.07	2.459	.117	0.12
Family Satisfaction	4.42	0.98	4.61	0.81	0.19	6.111	.014	0.20
Family Support	4.49	0.62	4.53	0.57	0.04	.605	.437	0.06
Social Fitness	4.20	0.51	4.39	0.42	0.19	23.576	.000	0.38
Engagement	4.23	0.61	4.46	0.52	0.23	23.377	.000	0.38
Friendship	4.27	0.62	4.46	0.47	0.19	15.556	.000	0.31
Loneliness	4.00	0.67	4.21	0.59	0.20	15.002	.000	0.30
Org. Trust	4.08	0.66	4.24	0.62	0.16	9.966	.002	0.25
Spiritual Fitness	3.72	0.76	3.82	0.73	0.09	2.476	.116	0.12

†n=2,224-2,339; ‡n=168-173

Table B- 5. Relationship between Selection to the CSL and Fitness Dimensions/Subscales

	No Selection†		Selection for Command‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.96	0.51	4.09	0.43	0.12	61.781	.000	0.25
Adaptability	3.83	0.75	3.86	0.71	0.03	1.590	.207	0.04
Bad Coping	3.69	0.71	3.77	0.65	0.08	13.005	.000	0.11
Good Coping	3.61	0.50	3.70	0.48	0.09	31.763	.000	0.18
Catastrophizing	4.17	0.58	4.27	0.52	0.10	29.255	.000	0.17
Character	3.93	0.70	4.07	0.59	0.13	38.759	.000	0.19
Depression	4.48	0.63	4.60	0.48	0.12	42.111	.000	0.20
Negative Affect	3.79	0.58	3.92	0.51	0.14	60.570	.000	0.24
Positive Affect	3.85	0.58	3.98	0.52	0.13	50.639	.000	0.22
Optimism	3.85	0.58	4.19	0.67	0.34	65.557	.000	0.46
Family Fitness	4.43	0.59	4.52	0.51	0.10	27.621	.000	0.16
Family Satisfaction	4.37	1.03	4.46	0.95	0.09	8.362	.004	0.09
Family Support	4.45	0.61	4.54	0.52	0.10	26.882	.000	0.16
Social Fitness	4.11	0.54	4.31	0.46	0.20	145.648	.000	0.37
Engagement	4.09	0.66	4.34	0.55	0.25	151.071	.000	0.38
Friendship	4.22	0.62	4.36	0.56	0.14	55.974	.000	0.23
Loneliness	3.97	0.66	4.13	0.61	0.16	59.258	.000	0.24
Org. Trust	3.97	0.72	4.21	0.61	0.24	119.374	.000	0.34
Spiritual Fitness	3.63	0.77	3.72	0.69	0.09	14.612	.000	0.12

†n=5,182-5,556; ‡n=1,199-1,245

Table B- 6. Relationship between Selection to the CSL and Fitness Dimensions/Subscales (Lieutenant Colonels Only)

	No Selection†		Selection for Command‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	4.05	0.44	0.11	34.081	.000	0.22
Adaptability	3.81	0.75	3.81	0.73	-0.01	.084	.772	-0.01
Bad Coping	3.67	0.71	3.73	0.65	0.06	4.403	.036	0.08
Good Coping	3.60	0.50	3.68	0.48	0.08	19.097	.000	0.17
Catastrophizing	4.16	0.59	4.25	0.53	0.08	14.535	.000	0.14
Character	3.91	0.72	4.03	0.61	0.12	20.944	.000	0.17
Depression	4.45	0.64	4.58	0.48	0.13	30.210	.000	0.21
Negative Affect	3.76	0.58	3.89	0.52	0.13	35.402	.000	0.22
Positive Affect	3.83	0.58	3.94	0.52	0.11	26.489	.000	0.19
Optimism	3.97	0.76	4.13	0.69	0.17	34.125	.000	0.22
Family Fitness	4.39	0.60	4.50	0.51	0.11	24.367	.000	0.19
Family Satisfaction	4.34	1.04	4.45	0.95	0.11	7.037	.008	0.10
Family Support	4.41	0.63	4.52	0.53	0.11	23.475	.000	0.18
Social Fitness	4.06	0.55	4.27	0.48	0.21	104.298	.000	0.38
Engagement	4.02	0.68	4.30	0.56	0.29	130.533	.000	0.43
Friendship	4.19	0.63	4.32	0.58	0.14	33.199	.000	0.22
Loneliness	3.95	0.67	4.10	0.62	0.15	35.378	.000	0.22
Org. Trust	3.92	0.74	4.17	0.64	0.25	82.781	.000	0.34
Spiritual Fitness	3.61	0.78	3.66	0.70	0.05	2.683	.102	0.06

†n=3,196-3,450; ‡n=836-869

Table B- 7. Relationship between Selection to the CSLand Fitness Dimensions/Subscales (Colonels Only)

	No Selection†		Selection for Command‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	4.00	0.50	4.17	0.40	0.16	35.533	.000	0.33
Adaptability	3.86	0.75	3.98	0.65	0.12	8.755	.003	0.17
Bad Coping	3.72	0.71	3.86	0.64	0.14	13.057	.000	0.20
Good Coping	3.63	0.49	3.74	0.45	0.10	13.897	.000	0.21
Catastrophizing	4.19	0.56	4.32	0.51	0.13	17.116	.000	0.23
Character	3.98	0.68	4.15	0.53	0.18	23.199	.000	0.27
Depression	4.52	0.61	4.65	0.45	0.13	15.426	.000	0.22
Negative Affect	3.83	0.57	4.01	0.49	0.18	31.535	.000	0.31
Positive Affect	3.90	0.57	4.08	0.51	0.18	32.543	.000	0.32
Optimism	4.08	0.74	4.34	0.59	0.27	42.952	.000	0.37
Family Fitness	4.49	0.57	4.57	0.50	0.09	7.435	.006	0.15
Family Satisfaction	4.41	1.01	4.51	0.94	0.09	2.530	.112	0.09
Family Support	4.51	0.59	4.60	0.50	0.09	7.328	.007	0.15
Social Fitness	4.18	0.52	4.39	0.40	0.21	54.299	.000	0.41
Engagement	4.21	0.61	4.42	0.52	0.21	37.932	.000	0.34
Friendship	4.26	0.61	4.44	0.49	0.18	29.290	.000	0.30
Loneliness	4.00	0.66	4.20	0.57	0.20	28.774	.000	0.30
Org. Trust	4.04	0.69	4.29	0.52	0.25	44.304	.000	0.37
Spiritual Fitness	3.67	0.77	3.86	0.64	0.20	22.138	.000	0.26

†n=1,984-2,106; ‡n=360-373

Table B- 8. Relationship between High Academic Achievement and Fitness Dimensions/Subscales (Medical Doctors)

	Non-Doctors†		Doctors‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	3.97	0.49	0.05	16.226	.000	0.09
Adaptability	3.85	0.74	3.82	0.74	-0.02	4.191	.041	-0.03
Bad Coping	3.49	0.80	3.63	0.77	0.13	115.089	.000	0.16
Good Coping	3.65	0.55	3.63	0.53	-0.02	4.210	.040	-0.03
Catastrophizing	4.13	0.61	4.10	0.64	-0.03	11.508	.001	-0.05
Character	3.93	0.71	3.98	0.70	0.05	20.724	.000	0.07
Depression	4.48	0.65	4.57	0.61	0.09	77.006	.000	0.13
Negative Affect	3.78	0.59	3.79	0.56	0.01	2.108	.147	0.02
Positive Affect	3.78	0.62	3.79	0.58	0.01	1.791	.181	0.02
Optimism	3.94	0.77	3.96	0.75	0.01	1.618	.203	0.02
Family Fitness	4.26	0.66	4.26	0.63	0.00	.121	.728	0.01
Family Satisfaction	4.34	1.00	4.49	0.89	0.15	91.818	.000	0.15
Family Support	4.21	0.76	4.17	0.75	-0.04	10.905	.001	-0.05
Social Fitness	4.02	0.55	4.09	0.52	0.07	60.771	.000	0.12
Engagement	3.96	0.71	4.10	0.67	0.14	176.115	.000	0.20
Friendship	4.18	0.65	4.24	0.57	0.06	39.657	.000	0.10
Loneliness	3.90	0.71	3.93	0.68	0.02	5.324	.021	0.04
Org. Trust	3.86	0.74	3.86	0.72	0.01	.404	.525	0.01
Spiritual Fitness	3.66	0.82	3.71	0.77	0.05	13.912	.000	0.06

†n=63,626-70,638; ‡n=4,131-4,576

Table B- 9. Relationship between High Academic Achievement and Fitness Dimensions/Subscales (Dentists)

	Non-Dentists†		Dentists‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	3.97	0.50	0.03	5.190	.023	0.07
Adaptability	3.85	0.74	3.84	0.73	0.00	.031	.859	-0.01
Bad Coping	3.49	0.80	3.51	0.83	0.02	.516	.473	0.02
Good Coping	3.65	0.55	3.62	0.55	-0.03	4.498	.034	-0.06
Catastrophizing	4.13	0.61	4.11	0.61	-0.02	1.326	.249	-0.03
Character	3.93	0.71	3.99	0.71	0.06	8.161	.004	0.08
Depression	4.48	0.65	4.54	0.63	0.06	10.816	.001	0.10
Negative Affect	3.78	0.59	3.80	0.57	0.03	2.988	.084	0.05
Positive Affect	3.78	0.62	3.82	0.57	0.05	6.432	.011	0.07
Optimism	3.94	0.77	3.95	0.77	0.01	.134	.714	0.01
Family Fitness	4.26	0.66	4.25	0.64	-0.01	.082	.774	-0.01
Family Satisfaction	4.34	1.00	4.44	0.92	0.10	11.113	.001	0.10
Family Support	4.21	0.76	4.16	0.75	-0.04	3.713	.054	-0.06
Social Fitness	4.02	0.55	4.07	0.52	0.04	7.699	.006	0.08
Engagement	3.96	0.71	4.05	0.67	0.09	20.030	.000	0.13
Friendship	4.18	0.65	4.21	0.61	0.04	3.534	.060	0.05
Loneliness	3.90	0.71	3.91	0.68	0.01	.452	.502	0.02
Org. Trust	3.86	0.74	3.87	0.71	0.02	.657	.418	0.02
Spiritual Fitness	3.66	0.82	3.75	0.79	0.09	12.939	.000	0.10

†n=63,626-70,638; ‡n=1,120-1,241

Table B- 10. Relationship between High Academic Achievement and Fitness Dimensions/Subscales (Veterinarians)

	Non-Veterinarians†		Veterinarians‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	3.86	0.49	-0.08	12.668	.000	-0.15
Adaptability	3.85	0.74	3.75	0.77	-0.10	9.521	.002	-0.13
Bad Coping	3.49	0.80	3.40	0.74	-0.10	8.462	.004	-0.12
Good Coping	3.65	0.55	3.59	0.53	-0.06	6.841	.009	-0.11
Catastrophizing	4.13	0.61	4.08	0.59	-0.04	2.710	.100	-0.07
Character	3.93	0.71	3.87	0.68	-0.06	3.991	.046	-0.09
Depression	4.48	0.65	4.42	0.59	-0.05	3.854	.050	-0.08
Negative Affect	3.78	0.59	3.68	0.56	-0.09	14.080	.000	-0.16
Positive Affect	3.78	0.62	3.63	0.59	-0.14	28.236	.000	-0.23
Optimism	3.94	0.77	3.87	0.78	-0.07	4.517	.034	-0.09
Family Fitness	4.26	0.66	4.19	0.69	-0.07	6.012	.014	-0.11
Family Satisfaction	4.34	1.00	4.26	1.09	-0.08	2.943	.086	-0.08
Family Support	4.21	0.76	4.12	0.79	-0.08	6.554	.010	-0.11
Social Fitness	4.02	0.55	3.94	0.54	-0.09	13.673	.000	-0.16
Engagement	3.96	0.71	3.99	0.64	0.03	.738	.390	0.04
Friendship	4.18	0.65	4.05	0.68	-0.12	19.870	.000	-0.19
Loneliness	3.90	0.71	3.74	0.72	-0.16	27.833	.000	-0.23
Org. Trust	3.86	0.74	3.73	0.72	-0.12	15.428	.000	-0.17
Spiritual Fitness	3.66	0.82	3.55	0.87	-0.11	9.716	.002	-0.13

†n=63,626-70,638; ‡n=470-552

Table B- 11 Relationship between High Academic Achievement and Fitness Dimensions/Subscales (Scientists)

	Non-Scientists†		Scientists‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	4.03	0.46	0.09	17.340	.000	0.00
Adaptability	3.85	0.74	3.99	0.67	0.14	20.334	.000	0.19
Bad Coping	3.49	0.80	3.34	0.84	-0.16	20.652	.000	-0.19
Good Coping	3.65	0.55	3.79	0.60	0.14	36.645	.000	0.26
Catastrophizing	4.13	0.61	4.17	0.56	0.04	2.265	.132	0.06
Character	3.93	0.71	4.04	0.66	0.11	13.440	.000	0.16
Depression	4.48	0.65	4.61	0.54	0.13	20.408	.000	0.19
Negative Affect	3.78	0.59	3.86	0.57	0.08	11.093	.001	0.14
Positive Affect	3.78	0.62	3.83	0.62	0.05	3.694	.055	0.08
Optimism	3.94	0.77	4.10	0.71	0.16	22.928	.000	0.20
Family Fitness	4.26	0.66	4.06	0.70	-0.19	46.397	.000	-0.29
Family Satisfaction	4.34	1.00	4.32	0.93	-0.02	.190	.663	-0.02
Family Support	4.21	0.76	3.91	0.86	-0.30	81.977	.000	-0.39
Social Fitness	4.02	0.55	4.05	0.54	0.03	1.307	.253	0.05
Engagement	3.96	0.71	3.99	0.71	0.03	1.012	.314	0.04
Friendship	4.18	0.65	4.21	0.65	0.04	1.660	.198	0.06
Loneliness	3.90	0.71	3.89	0.70	-0.01	.185	.668	-0.02
Org. Trust	3.86	0.74	3.87	0.75	0.01	.129	.720	0.02
Spiritual Fitness	3.66	0.82	3.91	0.79	0.25	52.152	.000	0.31

†n=63,626-70,638 ; ‡n=517-551

Table B- 12. Relationship between High Academic Achievement and Fitness Dimensions/Subscales (Lawyers)

	Non-Lawyers†		Lawyers‡					
	Mean	SD	Mean	SD	Mean Diff.	F	Sig.	Cohen's d
Emotional Fitness	3.94	0.51	3.93	0.50	-0.01	1.418	.234	-0.02
Adaptability	3.85	0.74	3.79	0.77	-0.06	14.982	.000	-0.08
Bad Coping	3.50	0.80	3.40	0.82	-0.10	35.649	.000	-0.13
Good Coping	3.65	0.54	3.65	0.58	0.00	.079	.779	0.01
Catastrophizing	4.13	0.61	4.10	0.61	-0.03	4.701	.030	-0.05
Character	3.93	0.71	3.91	0.70	-0.02	1.186	.276	-0.02
Depression	4.48	0.65	4.55	0.61	0.07	27.783	.000	0.11
Negative Affect	3.78	0.59	3.78	0.58	0.00	.031	.860	0.00
Positive Affect	3.78	0.62	3.71	0.63	-0.07	27.820	.000	-0.11
Optimism	3.94	0.77	3.95	0.79	0.00	.075	.784	0.01
Family Fitness	4.26	0.66	4.16	0.69	-0.10	51.218	.000	-0.15
Family Satisfaction	4.34	1.00	4.39	0.97	0.06	6.401	.011	0.06
Family Support	4.21	0.76	4.03	0.82	-0.18	131.394	.000	-0.24
Social Fitness	4.02	0.55	4.03	0.55	0.01	1.339	.247	0.02
Engagement	3.96	0.71	3.95	0.71	-0.01	.732	.392	-0.02
Friendship	4.18	0.65	4.17	0.68	0.00	.002	.964	0.00
Loneliness	3.90	0.71	3.86	0.72	-0.05	9.759	.002	-0.07
Org. Trust	3.86	0.75	3.91	0.71	0.05	11.659	.001	0.07
Spiritual Fitness	3.66	0.82	3.63	0.84	-0.03	3.078	.079	-0.04

†n=63,626-70,638; ‡n=2,112-2,358


COMPREHENSIVE SOLDIER FITNESS
PHYSICAL
FAMILY
SOCIAL
SPIRITUAL
EMOTIONAL
STRONG MINDS
STRONG BODIES